

What is claimed is:

1. A method of optical signal regeneration comprising the steps of:
 - generating a phase and amplitude encoded clock signal from at least an input optical signal;
 - introducing the encoded clock signal into a delay interference section of the regenerator such that an amplitude modulated clock signal is produced; and
 - outputting the amplitude modulated clock signal wherein the output amplitude modulated clock signal preserves information present within the input optical signal.
2. The method according to claim 1 wherein said delay interference comprises the steps of: N
 - splitting the encoded clock signal into at least two optical signals; and
 - delaying one of the encoded signals by an amount Δt from another signal wherein $\Delta t \cong N * \Delta t_{clk}$, where Δt_{clk} is a clock pulse time delay measured between subsequent clock signal pulses and N is an integer.
3. The method according to claim 2 further comprising the steps of:
 - optically amplifying the amplitude modulated clock signal.
4. The method according to claim 2 further comprising the steps of:
 - polarizing the amplitude modulated clock signal.
5. The method according to claim 2 wherein the delay interference section includes a bi-refractive fiber in optical communication with a phase shifter.
6. The method according to claim 5 wherein the delay interference section further includes a polarizer in optical communication with the phase shifter.
7. The method according to claim 1 wherein the generating step further includes the steps of:
 - applying the input optical signal to a coupling section of an optical regenerator;
 - and
 - applying a clock signal to a modulation section of the optical regenerator.
8. The method according to claim 7 wherein said coupling section comprises a photodiode.